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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yee S Ng

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07/26/2004

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EXAMINER

LEE, TOMMY D

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 07/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/628,397

Applicant(s)

NG ET AL.

Examiner

Thomas D. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-9 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 9 is/are allowed.
6) ☒ Claim(s) 1-5, 7 and 8 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office action is responsive to applicant's amendment filed March 29, 2004. Claims 1-5 and 7-9 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 3-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 3-5 have been amended to recite transformation of color separation image data already subjected to under color removal and/or gray component replacement "into a incoming current gray level pixel." The specification does not appear to disclose any means for converting image data to gray level data subsequent to the under color removal and/or gray component replacement. The specification states that "[t]he input image to the system is assumed to be a continuous-tone color separation (post-RIP rasterized image) after GCR (Gray Component Replacement) and UCR (Under Color Removal) processings have already been applied" (page 5, lines 22-25), but there is not disclosure of a means for transformation of the GCR- or UCR-processed input data to an incoming current gray level pixel.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,920,646 (Kamon) in view of U.S. Patent 5,703,971 (Asimopoulos et al.).

Regarding claim 1, Kamon teaches an edge enhancement processing system for modifying image data at certain pixel locations to include gray scale image data so as to reduce jaggedness in the image, the system comprising: a threshold device that establishes a current binary pixel value for an incoming current gray level pixel in accordance with a thresholding criterion (gradation processing circuit 19 (column 9, lines 62-67; column 12, lines 42-54)); and an edge enhancement image processing device that examines the current binary pixel and neighboring binary pixels in accordance with predetermined criteria for determining adjustment of the current pixel to a gray scale value to reduce edge jaggedness of the image (pattern memory 106 (column 11, lines 32-50); jagged line correction utilizes multi-value data for smoothing jagged oblique lines (column 13, lines 47-50)).

Kamon does not teach an adjustable threshold device with an operator accessible input to the threshold device for adjusting a threshold value in the thresholding criterion. Asimopoulos et al. teach an edge enhancement processing system (column 6, lines 54-59) that provides this feature (threshold calculation module 3, where "t" is set by a user (column 3, lines 50-57)). This

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provides the advantage of allowing a user to adjust to different background levels, thereby optimizing contrast of images and background, and thus it would have been obvious for one of ordinary skill in the art to modify the teaching of Kamon by providing a threshold calculation module such as taught by Asimopoulos et al.

Regarding claim 2, Kamon teaches an edge enhancement method for processing image data comprising: establishing a current binary pixel for an incoming current gray level pixel in accordance with a thresholding criterion that employs a threshold value (gradation processing circuit 19 (column 9, lines 62-67; column 12, lines 42-54)); examining a current binary pixel and neighboring pixels thereto in accordance with predetermined criteria to determine an adjustment of the current binary pixel to a gray scale value to reduce edge jaggedness of the image (pattern memory 106 (column 11, lines 32-50)); and substituting the gray scale value for the current binary pixel to reduce edge jaggedness of the image (jagged line correction utilizes multi-value data for smoothing jagged oblique lines (column 13, lines 47-50)).

Kamon does not teach a step of determining an adjustable threshold value in a holding criterion in response to an input from an operator. As mentioned above, Asimopoulos et al. teach an edge enhancement processing system (column 6, lines 54-59) that provides this feature (threshold calculation module 3, where "t" is set by a user (column 3, lines 50-57)). This provides the advantage of allowing a user to adjust to different background levels, thereby optimizing contrast of images and background, and thus it would have been obvious for one

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of ordinary skill in the art to modify the teaching of Kamon by providing a threshold calculation module such as taught by Asimopoulos et al.

6. Claims 2, 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamon in view of Asimopoulos et al. as applied to claim 2 above, and further in view of U.S. Patent 5,974,171 (Hayashi et al.).

The combined teachings of Kamon and Asimopoulos et al. are not directed to color separation image data that has been subjected to under color removal and/or gray component replacement (claim 3) or a color transformation process (claim 5) before being transformed into a binary pixel (transformation of image data having been subjected to UCR and/or GCR *to said incoming current gray level pixel* is not disclosed in applicant's specification, as mentioned above). Hayashi et al. teach an edge enhancement method (space filter 233 (Fig. 10) conducts edge enhancement or smoothing (column 9, lines 21-22)) which operates on color separation image data (CCD line sensor outputs RGB data (column 9, lines 2-3)) that has been subjected to under color removal and/or gray component replacement (masking UCR circuit 232 conducts masking and UCR by a matrix operation (column 9, lines 19-21)) and a color transformation process (minimum value extraction circuit 231 extracts minimum value from logarithm-converted CMY data from LOG conversion circuit 230 (column 9, lines 15-19)) before being transformed into a binary pixel (binarization circuit 235 (column 9, lines 24-26)). Since means for processing color image data are well known in the art and allow for the enhancement of edges found in color images as well as non-color images, thereby providing greater versatility, it would have been

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obvious for one of ordinary skill in the art to have modified the combined teachings of Kamon and Asimopoulos et al. by providing means for reading and transforming color images, such as taught by Hayashi et al.

Regarding claim 7, Asimopoulos et al., as mentioned above regarding claims 1 and 2, teach an adjustable threshold value which is determined in accordance with a selection by the operator (threshold calculation module 3, where "t" is set by a user (column 3, lines 50-57)). While not taught by Kamon in view of Asimopoulos et al., Hayashi et al. teach color image processing that includes under color removal and/or gray component replacement (masking UCR circuit 232 conducts masking and UCR by a matrix operation (column 9, lines 19-21)), and since means for processing color image data are well known in the art and allow for the enhancement of edges found in color images as well as non-color images, thereby providing greater versatility, it would have been obvious for one of ordinary skill in the art to have modified the combined teachings of Kamon and Asimopoulos et al. by providing means for reading and transforming color images, such as taught by Hayashi et al.

Claim Rejections - 35 USC § 102

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by Hayashi et al.

Hayashi et al. disclose an edge enhancement method for processing image data comprising: processing image data using under color removal and/or

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gray component replacement (noting Fig. 10, masking UCR 232); and adjusting edge enhancement processing of the image data in accordance with whether or not under color removal and/or gray level replacement is used or the extent of such use (space filter 233 (column 9, lines 21-23)). The output of the masking UCR is directly connected to the space filter (Fig. 10), and thus edge enhancement processing is adjusted according to the extent of the use of the masking UCR, since the output value of the masking UCR directly determines the value of the input to be processed by the space filter.

Allowable Subject Matter

9. Claim 9 is allowed.

10. The following is a statement of reasons for the indication of allowable subject matter: As mentioned in the Office action mailed January 15, 2004, at item no. 8, No prior art has been found to disclose or suggest the step of "adjusting edge enhancement processing of the image data in accordance with whether or not under color removal and/or gray component replacement is used or the extent of such use, wherein the adjustment includes adjustment of a threshold value used for comparing image data processed by under color removal and/or gray component replacement," as recited in claim 9.

Response to Arguments

11. Applicant's arguments, see page 8, line 26 – page 9, line 24 of amendment, filed March 29, 2004, with respect to the rejection(s) of claim(s) 8 under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further

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consideration, a new ground(s) of rejection is made in view of Hayashi et al. The rejection is set forth above.

12. Applicant's arguments filed in response to the reject of claims 1-3, 5 and 7 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive.

In response to the prior rejection of claim 1, applicant asserts that the edge enhancement anti-aliasing image processing device is quite different from the edge enhancement processing system disclosed in Kamon (amendment, at page 9, line 30 – page 10, line 1). This amounts to a mere allegation without evidence supporting applicant's assertion, and thus applicant's argument is not persuasive.

Applicant asserts that the dynamic threshold disclosed in Asimopoulos et al. is a function of background level and information level, and is changed dynamically from pixel to pixel, and thus is not an operator accessible input for adjusting a threshold value (amendment, at page 10, lines 1-14). This argument is not persuasive, for the dynamic threshold disclosed in Asimopoulos et al. is also a function of "t," which is a fraction set by a user (column 3, lines 50-57).

Applicant asserts that the setting of the dynamic threshold in Asimopoulos et al. is different from the selection of a threshold value as disclosed in applicant's invention (amendment, at page 10, lines 14-19). This argument is not persuasive, for Asimopoulos meets the requirement of operator accessible input to the threshold device for adjusting a threshold value in the thresholding criterion by providing user input of "t."

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Applicant asserts that Asimopoulos et al. do not disclose anti-aliasing edge enhancement method or output data other than binary data, and thus applicant's invention would not be obvious in view of cited references (amendment, at page 10, lines 19-23). This argument is not persuasive, for as mentioned in the prior Office action, the threshold calculation module in Asimopoulos et al., provided in an edge enhancement system (column 6, lines 54-59), allows a user to adjust to different background levels, thereby optimizing contrast of images and background.

Applicant provides similar arguments in response to the prior rejection of claims 2 and 7 (amendment, at page 10, line 24 – page 11, line 5; page 11, line 28 – page 12, line 7). These arguments are not persuasive, for the reasons mentioned above.

In response to the prior rejection of claims 3 and 5, applicant asserts that these claims positively recite transforming image data via the adjustable threshold into binary data first before the edge enhancement anti-aliasing method (amendment, at page 11, lines 17-22). This limitation is met by Kamon, where gradation processing circuit 19 (column 9, lines 62-67; column 12, lines 42-54) transforms image data into binary data before edge enhancement processing by pattern memory 106 (column 11, lines 32-50; column 13, lines 47-50).

Conclusion

In view of new grounds for rejection of claim 8, not necessitated by amendment, this Office action is non-final.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas D. Lee whose telephone number is (703) 305-4870. The examiner can normally be reached on Monday-Friday (7:30-5:00), alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (703) 308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thomas D. Lee
Primary Examiner
Art Unit 2624

tdl
July 22, 2004